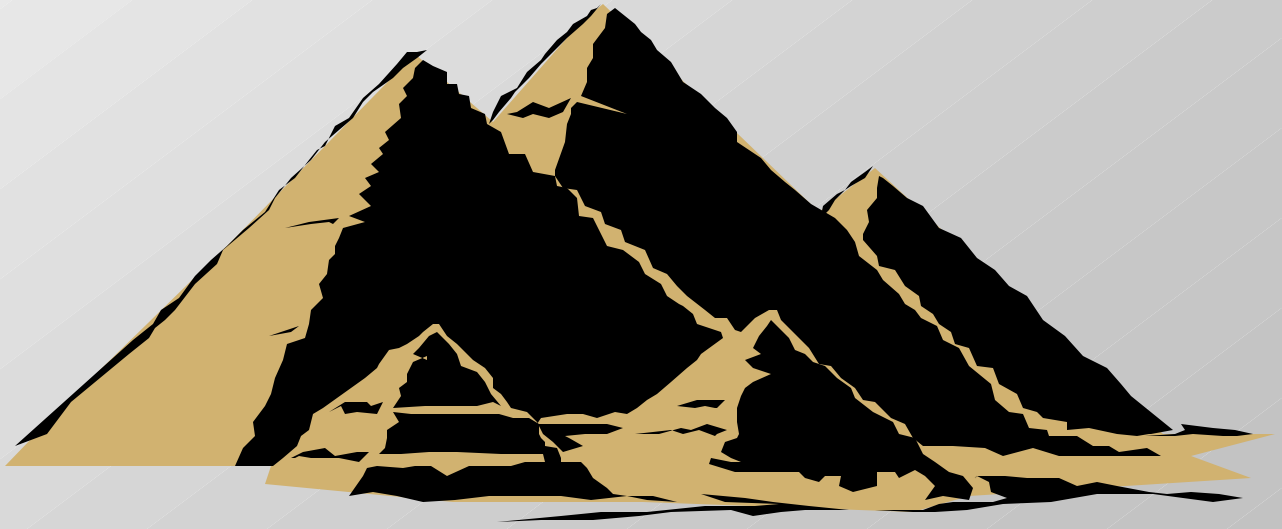
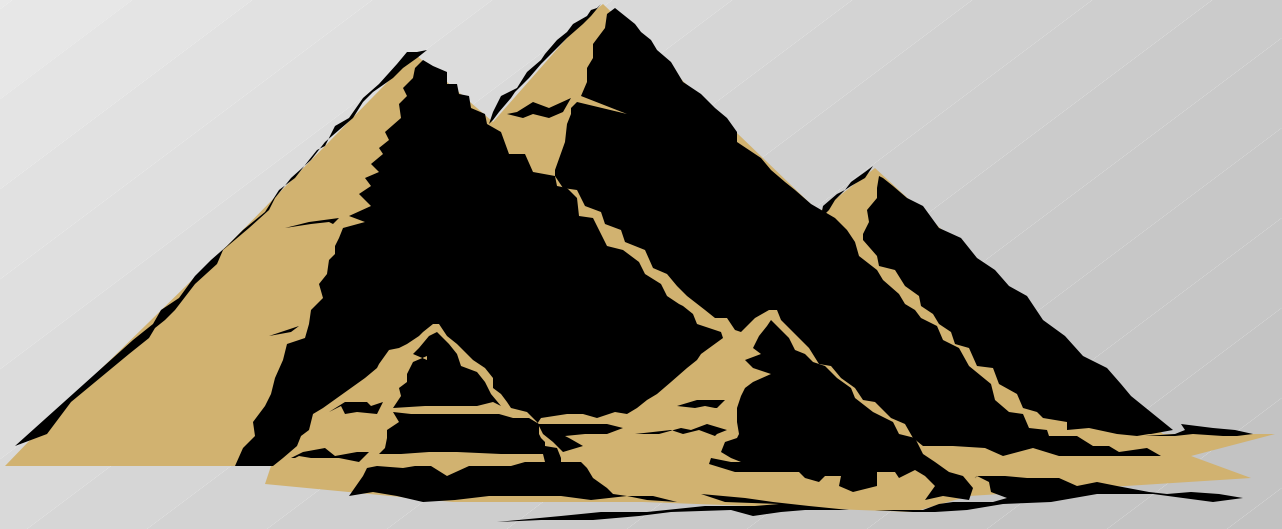
Maturity Model Development

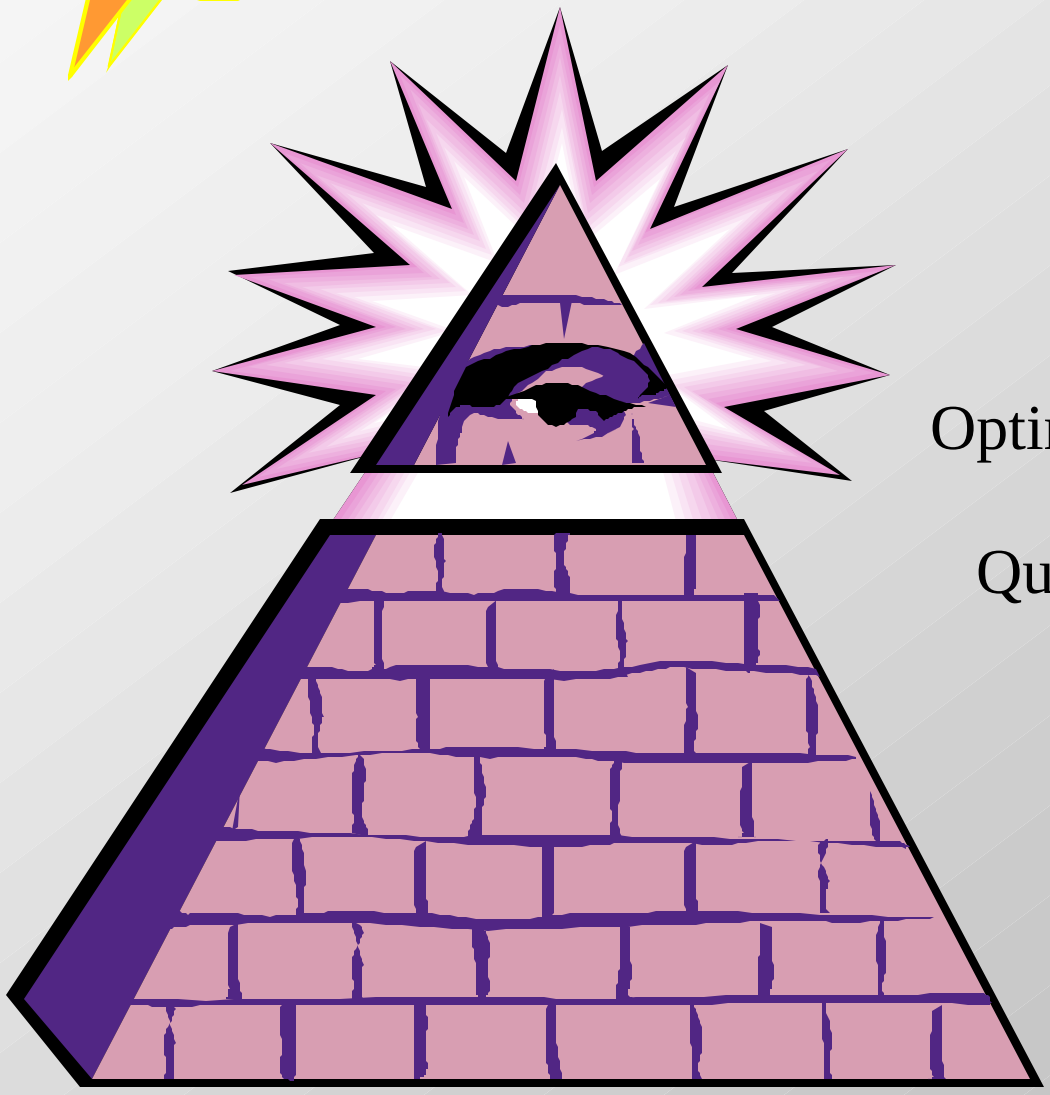


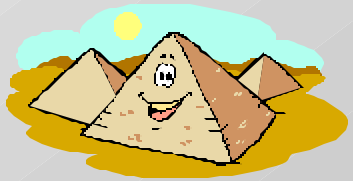
Roadmap for DCMC EVMS

- **Vision:**
  - **Consistent satisfaction of customer expectations through a government and Industry Partnership using world-class processes and practices**



Climbing the Pyramid





Optimized

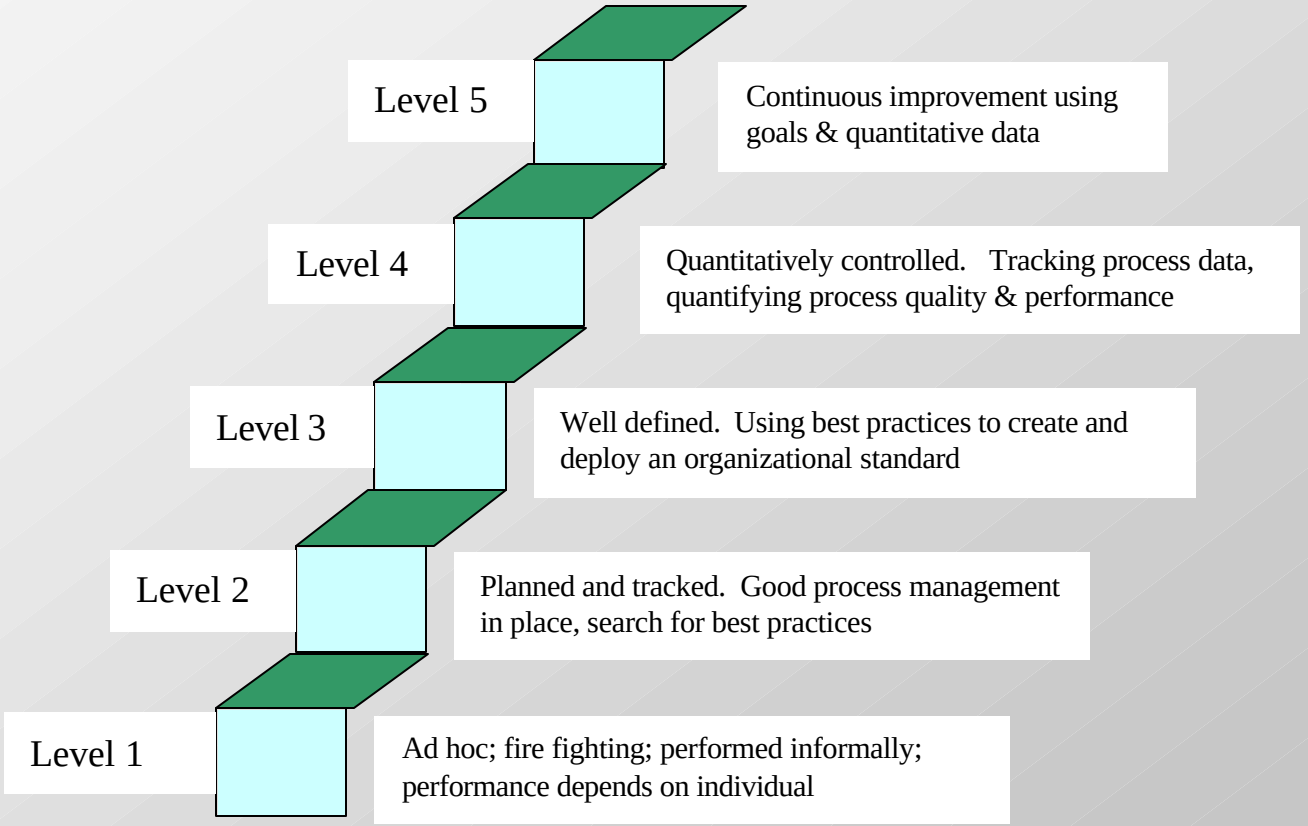
Quantified

Defined

Repeatable

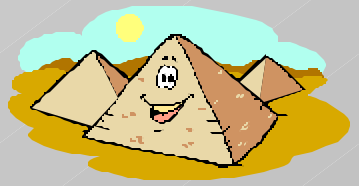
Perfomed

DCMC Maturity Model

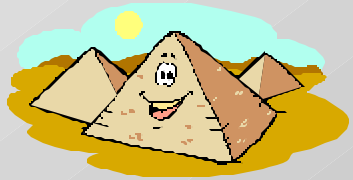


Climbing the Pyramid

- **Level 1**
  - **viewed as unique and autonomous**
  - **variable or ad hoc, with few common acceptance, surveillance or reporting processes**
  - **CAO success depends heroic performance**
  - **general lack of coordination and communication**
  - **CAO may still be successful, but success not repeatable**

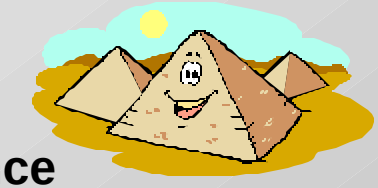


Climbing the Pyramid



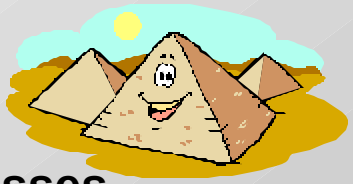
- **Level 2**
  - **processes are repeatable**
  - **policies and procedures established**
  - **surveillance processes are practiced, documented, enforced, trained, and measured**
  - **planning and tracking of EVM systems is stable and problems are identified and followed up**
  - **Some EVMS measurements in place**
  - **CAO members are aware of DoD EVMS policy and guidelines**
  - **Some training in EVMS tools and processes**
  - **EVMS analysis is accurate, timely, documented, measured and followed up**

Climbing the Pyramid



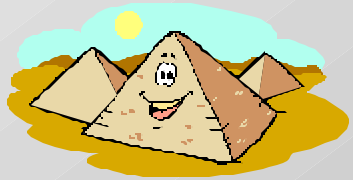
- **Level 3**
  - **standard CAO process for system and program surveillance**
  - **reporting to customers is documented and these processes are integrated into a coherent whole**
  - **standard is understood by management**
  - **an DCMC wide training program is implemented**
  - **EVMS products are standard and consistent because processes are stable and repeatable**
  - **capability is based on an organization wide understanding of activities, roles and responsibilities.**
  - **CAO has implemented a joint CAO/Contractor EVMS surveillance plan**

Climbing the Pyramid



- **Level 4**
  - **organization tracks metrics for EVMS products and processes**
  - **productivity and quality are measured for EVMS processes as part of an organizational measurement program**
  - **corporate systems capture relevant data on EVMS metrics**
  - **CAOs and program offices work together to manage metrics**
  - **the process is predictable because it is measured and operates within the limits**
  - **CAO predicts trends and take corrective action**
  - **EVMS products are high and consistent quality**

Climbing the Pyramid

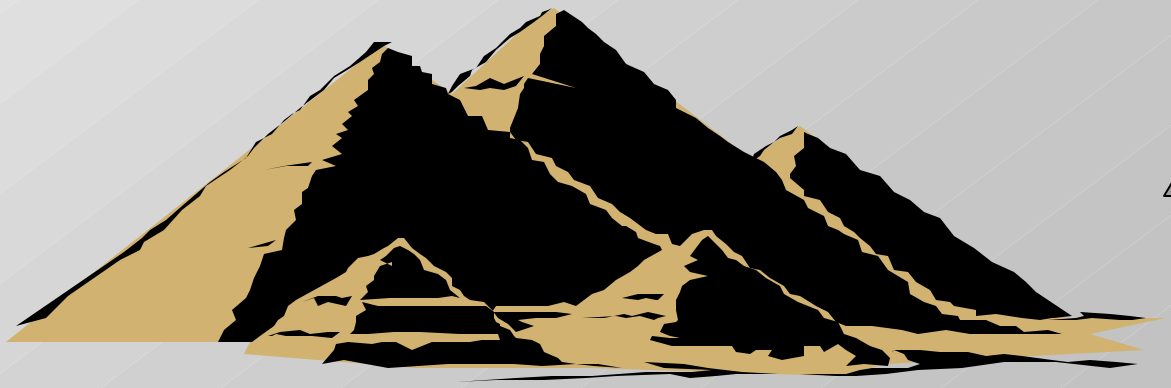


- **Level 5**
  - **the entire organization is focused on continuous improvement**
  - **innovative ideas and technologies**
  - **system success is the norm**
  - **New lessons learned are disseminated to other programs**
  - **organization continuously strives to improve the range of their process capability, improving information for decision making**

- **Desired result**
  - **DCMC process improvement has a strong positive influence on contractor performance. Cost and schedule performance improves due to EVMS intelligence and consequent IPT action to correct potential problems.**

Climbing the Pyramid

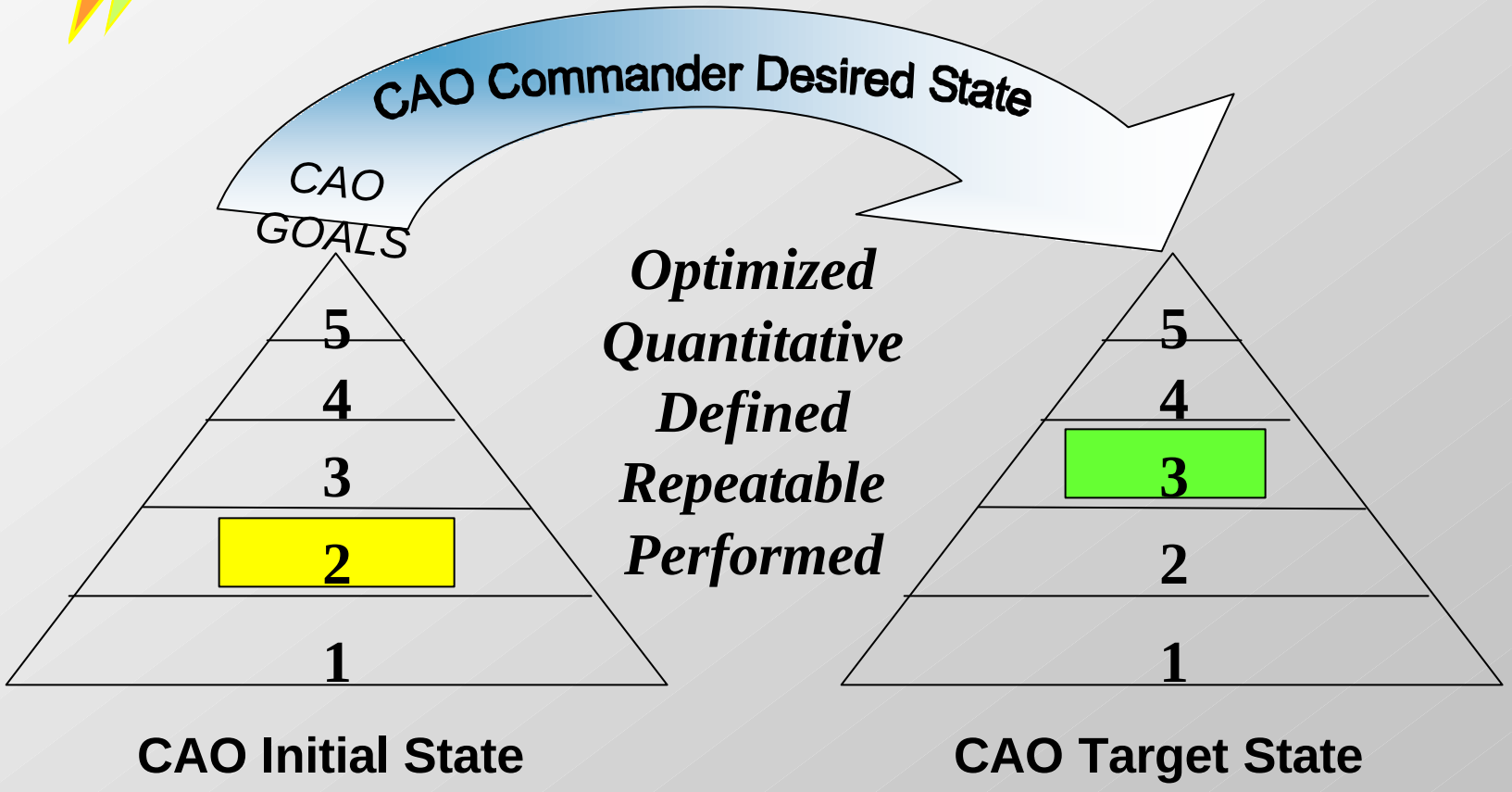
- **Strategic EVMS Goals**
- **principles applying to Maturity Models are applicable to EVMS in DCMC**
- **they allow the Command to visualize the journey to innovative process management and improvement**
- **continued working relationships with our corporate partners**



DCMC Maturity Model

- Performed Level
- Repeatable Level
  - Surveillance Planning
  - Surveillance Management
  - Program Analysis and Reporting
  - System Surveillance
- Defined Level
  - EV Process Definition and Maintenance
  - Supplier Performance Management
  - DCMC Risk Management
  - Training
- Quantitative Level
  - Quantitative EVMS
- Optimized Level
  - Continuous Process Management

DCMC Maturity Model



Terms

- **Key Process Area: A cluster of related activities that, when performed collectively, achieve a set of goals considered to be important for establishing process capability.**

- **Goals: A summary of the key practices of a KPA that can be used to determine whether an organization or project has effectively implemented the KPA. The goals signify the scope, boundaries, and intent of each KPA.**

- **Key Practices: The infrastructure and activities that contribute most to the effective implementation and institutionalization of a key process area.**

The five common features are:

- **Commitment to Perform: Actions the organization must take to ensure that the EVMS activity is established and will endure. Commitment to perform typically involves establishing organizational policies and leadership.**

- **Ability to Perform: Preconditions that must exist in the organization to implement EVMS activities competently. Ability to perform typically involves resources, organizational structures, and training.**

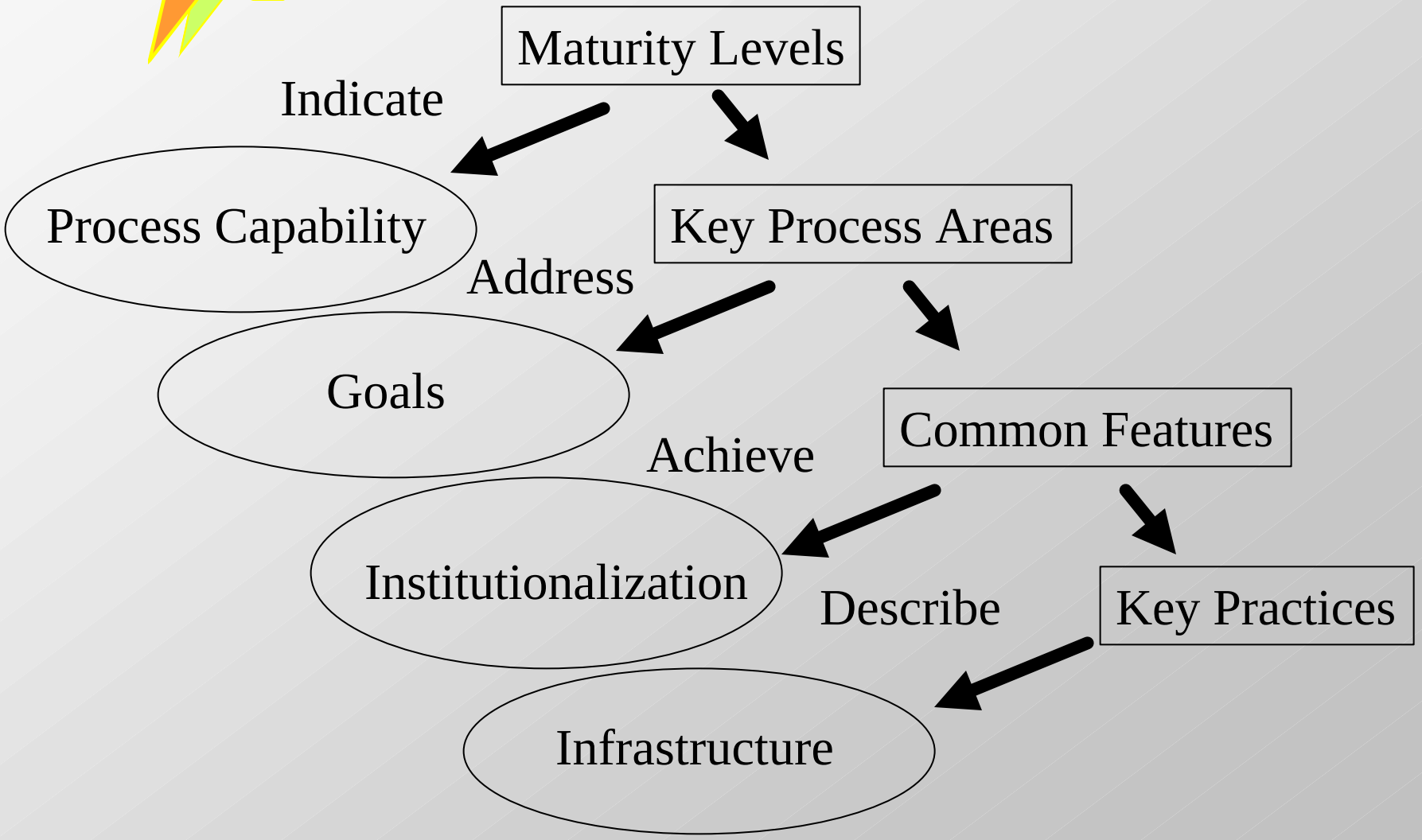
- **Activities to Perform: Descriptions of the activities, roles, and procedures that are necessary to implement a KPA. EVMS activities performed typically involve establishing plans and procedures, performing and tracking the work, and taking corrective actions as necessary.**

The five common features are:

- **<u>Measurement and Analysis</u>: Description of the basic measurement practices that are necessary to determine status related to EVMS activities. These measurements are used to control and improve the performance of EVMS surveillance. Measurement and analysis typically includes examples of the measurements that could be taken throughout the performance of EVMS activities.**

- **<u>Verifying Implementation</u>: Steps are taken to ensure that the EVMS activities are performed as described in the CAO defined process. Verification typically encompasses periodic reviews and evaluations by CAO management.**

DCMC Maturity Model



To identify Command-wide performance indicators in specific EVMS activities

KPA RATING

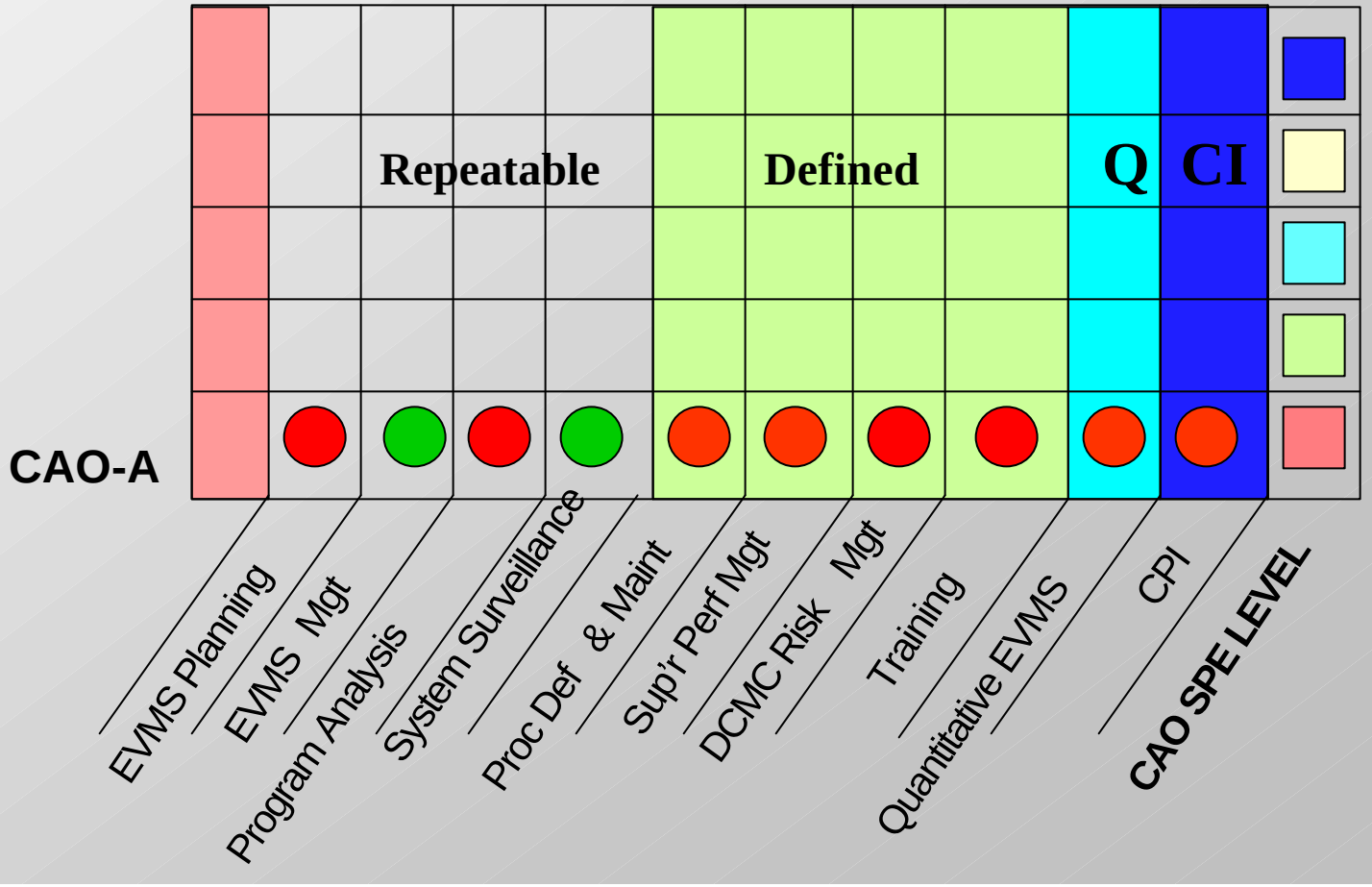
= KPA CRITERIA MET

= KPA CRITERIA NOT MET

LEVEL RATING

- **Performed**
- **Repeatable**
- **Defined**
- **Quantitative**
- **Optimized**

KPA SATISFACTION PROFILE



Maturity Level	Co1	Co2	Co3	Ab1	Ab2	Ab3	Ab4	Act1	Act2	Act3	Act4	Act5	Act6	Act7	Me1	Me2	Ve1	Ve2
Level 1: Performed																		
No Key Processes																		
Level 2: Repeatable																		
EVMS Planning	Y	N		Y				Y	N	N	Y	Y			N		Y	N
EVMS Management	N	Y		Y	Y	Y	N	N	N	N					N		Y	
Program Analysis and Reporting	Y	Y		Y	Y	N		Y	N	Y	Y	Y	N	N	N		N	N
System Surveillance	Y	Y		Y	Y	N		N	N	N	N				N		N	N
Level 3: Defined																		
CAS Process Definition and Maintenance	N	Y	Y	Y	Y	Y	N	N	N	N	Y	N	N		N		N	
Supplier Performance Management	Y			Y	Y			N	N	Y	N	Y	Y		N		N	N
DCMC Risk Management	N	N		N	Y	Y		N	Y	N	N	N			N		N	N
Training	Y	Y		N	Y	Y		N	Y	Y	Y	N			Y		Y	Y
Level 4: Quantitative																		
Quantitative CAS	N	N		N	N			N	N	N	N	N	N		N		N	N
Level 5: Optomized																		
Continuous Process Improvement	N	Y	N	Y	Y			N	N	N	N	Y	N		N	N	N	N

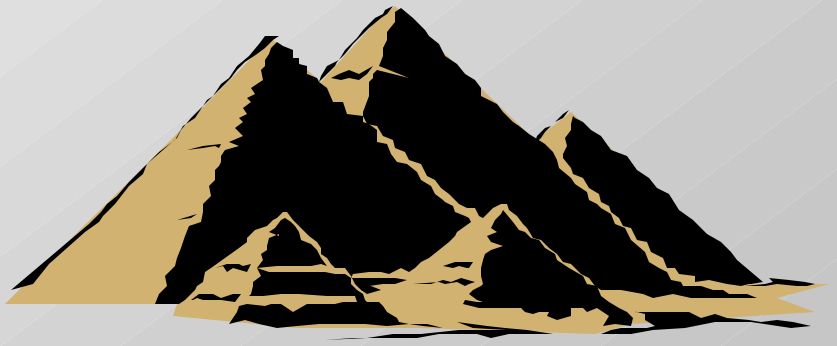
Not Met N Met Y

Model Development Timeline

- **Sep 98. EVMS Baseline Review completed. Maturity Model concept suggested to improve EVMS.**
- **Nov 98- Feb 99. EVMS-MM development**
- **Mar 99. EVMS-MM briefed to Ms Pettibone and DCMC HQ. Suggested integration with Software Center maturity model activities.**
- **Apr 99. Two EVMS Center personnel participate in Software Maturity Model (SPE-MM) development**
- **May 99. EVMS-MM revised to enable integration and DCMC wide deployment with the SPE-MM.**
- **Jun 99. Software maturity model (SPE-MM) briefed to Ms Pettibone. EVMS-MM tested in four CAO sites.**

Pilot Test Objectives

- Test the EVMS-MM and the MM approach
  - Does the model provide a clear map for process improvement in EVMS?
- Collect feedback from the CAO on the model
- Search for best practices
- Provide a roadmap for improvement to CAO Commander



Situation Analysis

➢ Key Strengths

- EVMS-MM provides a valuable tool
- CAO accepted the results as fair, stated that the test was a positive experience
- POC logistical support was excellent
- CAOs were prepared for the test – some had attempted USA model
- Good mix of people on the model team
- Review more consistent and objective than previous reviews
- Reasonable expectations at HQ and CAOs on CAO level
- Commanders set a positive tone
- Teaming relationship with CAO members
- Increases EVMS knowledge across PST
- Visible steps to continuous improvement. Broader horizon.

Situation Analysis

➢ Key Weaknesses

- Not user friendly enough for USA
- Questions were difficult to understand
- Need to fix question links to One Book
- Clarify terms (EVMS Monitor vs PST member)
- Need glossary (Supplier)
- Clarify difference between System and Program issues
- Some KPAs too difficult to interpret and understand (Risk Management, Supplier Performance Management)
- Develop more examples of measurements and metrics
- Need to define EVMS management roles (PI/ EV Monitor)

Situation Analysis

➢ Key Opportunities

- Make model more user friendly/useful to CAO
- Concept of separate levels of development for key functions eg program analysis
- Advanced Program Analysis at Level 3
- Baseline integrity/ System Surveillance/ Scheduling beefed up
- Add more value
- Integrate with contractor/ IPT process improvement
- Develop a decision tree questionnaire, to reduce number of questions
- Set level goals yearly, incorporate best practices from other sites to increase maturity
- Provide specific training in the model
- Integrate with Software efforts

Situation Analysis

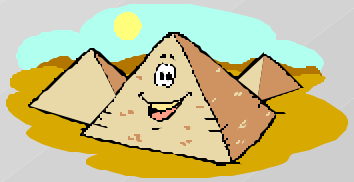
➢ **Key Threats**

- CAOs don't have enough resources to conduct this level of self assessment
- Tool becomes too complicated for internal use
- Commanders become competitive and aim to compare levels rather than improve processes
- Level 5 becomes the aim, rather than level 3
- Internal tool becomes external review
- Customers could judge DCMC as lacking competency if they don't achieve level 5
- Premature IOA deployment

➢ Lack of clear guidelines for usage

Results Summary

- Results for the model test were positive.
  - EVMS-MM provides a valuable tool
  - Commanders and Staff accepted the results as fair & objective
  - Opportunities for improvement - team and CAO feedback



Backup Charts

Surveillance Planning

- **Purpose**
  - The purpose of Surveillance Planning is to ensure that reasonable planning for EVMS surveillance is conducted and that all elements of the system and programs are included.
- **Commitments**
  - CAO has a System Surveillance Plan
  - Program EVMS surveillance plans
- **Abilities**
  - Adequate resources for planning
- **Activities**
  - System Surveillance plan sufficient
  - Joint surveillance encouraged, plan circulated
  - PST reviews contract EVMS clauses
  - CAO ensures supplier (contractor) has an accepted system
  - Plans updated annually
  - MOA/LOD sufficient
  - CAO involved in early CAS
- **Measurements**
  - made and used to track surveillance planning activities
- **Verification**
  - Plans reviewed by CAO management
  - Management reviews planning activities

EVMS Surveillance Management

- **Purpose**
  - The purpose of Surveillance Management is to manage the EVMS activities to ensure that the CAO provides timely and reliable system surveillance and program assessments to the buying activity (DoD, NASA, FAA, DOE).
- **Commitments**
  - EVMS activities tracked and managed to plans
  - Responsibility for EVMS management designated
- **Abilities**
  - Formal EVMS Monitor appointed
  - Adequate resources for EVMS management
  - Trade offs permitted in EVMS activities when resources short
  - Managers have experience and training in EVMS
- **Activities**
  - EVMS activities managed to plans
  - Corrective action process when activities deviate from plans
  - CAO management tracks EVMS activity status, budget
- **Measurements**
  - made and used to determine the effectiveness of EVMS
- **Verification**
  - Commander reviews EVMS management

Program Analysis and Reporting

- **Purpose**
  - To provide value added insight to customers on the program's current and projected cost and schedule status.
- **Commitments**
  - Responsibility for Program Analysis and Reporting designated
  - EVMS Monitor assisted by contract experts
- **Abilities**
  - Group or individuals tasked to perform Program Analysis and Reporting
  - Adequate resources and analysis tools
  - Individuals doing Program Analysis and reporting are trained and experienced
- **Activities**
  - PI/PST participate in program review and meetings
  - PI/PST performs Program Surveillance as described in tasking sheet
  - PI/PST provides recommendations, predictive analysis and program status
  - Problems with CPRs are managed using a Corrective Action system
  - PI/PST provides timely and insightful reports
  - CAO conducts risk based surveillance
  - PI/PST monitors performance of major subs
- **Measurements**
  - determine the status (timeliness, quality) of Program analysis activities
- **Verification**
  - Managers and Commander review Program Analysis and Reporting activities

System Surveillance

- **Purpose**
  - To ensure that EVMS data is valid and used for program management. System integrity is ensured through on-site surveillance and annual system health assessments and reporting.
- **Commitments**
  - System surveillance plan exists
  - Responsibility for System Surveillance is assigned
- **Abilities**
  - Individual or team is formed to conduct system surveillance
  - Adequate resources for system surveillance
  - Individuals doing System Surveillance are trained and experienced
- **Activities**
  - EVMS Monitor performs System surveillance according to plan
  - Results are examined across programs and reported
  - Annual health check conducted and reported to customers
  - EVMS Monitor reviews changes to System Description
  - Problems managed using a corrective action system
- **Measurements**
  - determine the status and outcome of system surveillance activities
- **Verification**
  - Managers and Commander review System Surveillance activities

Process Definition and Maintenance

- **Purpose**
  - To define a CAO's EVMS standard process, collect data on process performance, and coordinate efforts to evaluate and improve the process.
- **Commitments**
  - Written plan for process development and maintenance
  - Management sponsors EVMS standard plan
  - Responsibility for development and maintenance assigned
- **Abilities**
  - Group or individuals tasked to perform process development
  - Adequate resources available
  - Individuals doing process development are trained and experienced in EVMS
  - CAO PST members receive training in the standard process
- **Activities**
  - CAO Standard process is documented and reviewed
  - CAO performs activities in accordance with standard process
  - Standard is tailored for programs
  - Process information maintained and available
  - PST teams informed of standard process updates
  - Guidelines for tailoring standard to program is developed
- **Measurements**
  - determine the status of process definition activities
- **Verification**
  - Management reviews process definition activities

Supplier Performance Management

- **Purpose**
  - To be proactive regarding supplier performance and contract compliance issues and to minimize the effects of these issues.
- **Commitments**
  - Interdisciplinary teams established
- **Abilities**
  - PI/PST receives orientation in process used by other teams
  - CAO members receive teamwork orientation
- **Activities**
  - PST coordinates activities with other PSTs
  - Trend analysis conducted on Supplier performance
  - CAO EVMS activities foster a cooperative environment with customer and supplier
- **Measurements**
  - determine the status of supplier performance management activities
- **Verification**
  - Management reviews EVMS supplier performance management activities

DCMC Risk Management

- **Purpose**
  - To identify risks applicable to performance of EVMS activities as early as possible. Resource, Program and System risk are all part of EVMS risk management.
- **Commitments**
  - EVMS Standard plan includes risk management issues
  - Responsibility for risk management assigned
- **Abilities**
  - Individual/ group performing risk management
  - Adequate resources available
  - Individuals doing risk management are trained and experienced
- **Activities**
  - Risk management issues integrated into CAO standard for EVMS
  - EVMS Monitor identifies EVMS risk issues
  - Analyzes risks
  - Risk management activities planned and documented
  - Risks tracked and controlled until mitigated
- **Measurements**
  - determine the status of risk management activities
- **Verification**
  - Management and Commander review EVMS risk issues

Training

- **Purpose**
  - To develop the skills and knowledge of EVMS Monitor(s), PI and PST members so that they can perform EVMS effectively and efficiently.
- **Commitments**
  - IDPs identify training needs
  - Responsibility for coordinating EVMS training assigned
- **Abilities**
  - Group or individuals exist to manage training and mentoring needs
  - Adequate resources available
  - Individuals doing training management are trained and experienced in EVMS
- **Activities**
  - CAO identifies training needs, establishes mentoring program
  - EVMS Monitor, PI and PST members receive training
  - Training records maintained
  - CAO determines effectiveness of training
- **Measurements**
  - Determine the status of training activities
  - Determine skill levels and development of EVMS Monitor
- **Verification**
  - Management and Commander reviews training activities

Tasking Sheets

- Provide information on each task required by the model
- Each is a question
  - Does the CAO perform this task as described? Yes/No
- Includes:
  - KPA Level, Purpose
  - Feature discussed
  - Meaning of the feature
  - Details of the task
- Provide a discussion point during interviews
- Source information to complete the “Roadmap chart”.

Sample Tasking Sheet

EVMS-MM Level: 3 DEFINED	**One Book Reference** **Chapter** 3.1.2/4.6.1 (Apr 99) **Part** n/a	**Question Number** 3.4.2
Key Process Area (KPA) TRAINING	**Feature** COMMITMENT 1	

KPA Purpose
Training develops the skills and knowledge of EVMS Monitor(s) so that they can perform EVMS effectively and efficiently.

Description
Commitments are actions that an organization must take to ensure the EVMS activity is established and will endure. Commitment usually involves establishing organizational policies and leadership..

Task Statement

The CAO has established individual development plans (IDP) for identifying its training needs.

The CAO performs this task as described:

YES ☐ **NO** ☐

If YES, move to Question	3.4.3	If NO, move to Question:	3.4.3